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"Critical Elements for the Information Enterprise" from The Entrepreneur's Intellectual Property & Business Handbook

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Critical Elements for the Information Enterprise

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This article is part of a series of book excerpts from [The Entrepreneur's Intellectual Property & Business Handbook](#), which provides the business, strategy, and legal reference guide for start-ups and small businesses.

Information, like any other type of property, has value to the extent that it meets the standards of relevance to the recipient. Relevance may be based in part on exclusivity, but it is also based on the reliability, resilience, and security of the information. Particularly when the information is data rather than entertainment content, these features will determine the success or failure of the enterprise. Without all three elements of validity—reliability, resilience, and security—the information will be suspect.

1. Reliability as Verification of the Information.

Reliability is a measure of the trustworthiness of the source of information. For scientific information, the academic industry relies upon the peer-review process to review and verify the information before publishing findings. This process of verification assures scientific journal readers that the published information is reliable. Retractions, or other challenges to published data, undermine both the reliability of the data and the entire verification process.

Reliability may come from the independence of the verifying source or from the proximity of the source. Product specification information, for example, will likely be treated as more reliable if it comes directly from the manufacturer, because the likelihood of error is reduced. If there are incentives for the business to be untruthful, then independent review from outside organizations, governmental agencies, or other independent sources are often deemed more reliable.

Reliability is a critical concern on the Internet because there is no publishing process. Anyone can publish a blog, edit Wikipedia, or add other types of content. A reputation system by the vote of readers may help for content that does not have a strong editorial or peer-review process, but such votes will tend to emphasize popularity rather than accuracy. As a result, there will remain a strong need for independently verified information.

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Sidebar—Russian Bots and the Disinformation Crisis.

The growth of social media platforms as the primary medium through which news and information are published and distributed has had a disturbing impact on the ability of the public to use source of information as a surrogate for reliability. Instead of getting news from newspapers, radio, or television, the public increasingly sees those mass-media outlets as feeders for social media content promoted based on popularity rather than reliability. This resulted in a massive public fraud in the U.S. presidential 2016 election.

In February 2017, the FBI brought a wide-ranging criminal indictment against an organization known as the Internet Research Agency, an organization operated by Russian intelligence and funded through Russian government operations. The indictment alleged a campaign by which Russian operatives invested tens of millions of dollars in websites, astroturfing activities, paid advertisements on Facebook and other social media outlets, computer networks, cryptocurrency accounts, and sophisticated data analytics. The $100,000 in Facebook ads that tipped investigators to the attack on U.S. elections was the tip of a very sophisticated cyber-iceberg.

At the heart of the operation was a strategy to flood U.S. social media with false and highly inflammatory information that would drive those who generally held moderate political opinions to more extreme versions of those opinions. Based on the operational approach, the goal was not apparently to shift the electorate to the right or to the left. Instead the goal was to shift the electorate away from the center, and in that effort the goal was accomplished quite effectively. The Internet Research Agency created many versions of ads and posts that were critical of some candidates and laudatory of others. Most of the claims were false and overblown. But using sophisticated data analytics, the Internet Research Agency would use its bots to promote different extreme positions. The public would react, often with revulsion or exasperation that the other party could say such things. And post-by-post, wedge-by-wedge, these false statements would lessen the ability of politically-interested individuals to engage with members of the opposite party.

It cannot be established whether this process changed the outcome of the election or the subsequent difficulty Congress has witnessed in the increasingly divided populace. It may have occurred precisely when the politics were pushing in these directions anyway. But the intentional falsity of the content highlights the inability of the public to discriminate between authentic information, inaccurate but well-intended publications, and intentional lies.

The Internet Research Agency reflects the best example of what happens when reliability fails. Instead of basing reliability on the historical accuracy of a source or a process of content vetting, the public has increasingly relied on social media platforms and the popularity of content to establish reliability. Popularity has no direct relation to accuracy and the result was that highly interesting but intentionally false information was regularly shared by the public and promoted as truthful.

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2.   *Resilience of Source and Durability of Information.*

Resilience of source means the source of the content will remain available for a reasonable period of time. Given the large numbers of websites that are created and forgotten, URLs which become broken links, or web pages that are orphaned as the architecture and content of websites are updated, it seems that much of the information on the Internet is almost ephemeral. In contrast, libraries provide an expensive, but critical, service of adding permanence to knowledge. They achieve this by building and cataloging a collection of materials and serving as conservators of the physical manuscripts on which the content is stored. Libraries and academics require permanence of information. The Internet poses a serious problem for academic libraries and institutions that require permanence rather than transitory existence.

Resilience and reliability are also tied together because information that disappears from the Internet can no longer be verified and is no longer deemed reliable. Business, consumer, and student users of the Internet require at least resilient storage of the content provided through the Internet. Ephemeral sites can do more harm than good, leading readers to unsupportable conclusions and down blind alleys.

Resilience of access has also become a problem. As the public relies increasingly on search as the method for navigation on the Internet, the constant addition of new content, new device modes, and new pages can make it increasingly difficult to return to content. It is still hosted somewhere, but it is buried in a digital haystack that makes it impractical to access.

The need for resilience is at once both a stressor, calling out for innovation and business solutions, as well as a flaw inherent in the communications model of the Internet. Proprietary services like Lexis-Nexis and Westlaw provide comprehensive text-based databases that are expensive to maintain, but they provide the resilience necessary to be used as primary search tools. Industry and law rely very heavily on these databases for published information in electronic form, but being proprietary, they are private subscription systems. Because of their proprietary nature, government agencies and others with public duties towards content dissemination increasingly rely on Internet-based resources. These have the benefit of being open and publicly available. Unfortunately, open systems often have weak infrastructure. This, in turn, increases risks regarding the data resilience and reliability. In consequence, as the volume of data has increased, and the data have increasingly been made publicly available, the security of that infrastructure has weakened.

Because the need for resilience is an obvious stressor, companies and academic institutions should be working to create the resilience necessary to bring an increasing amount of Internet content into the realm of sustainable content. Sadly, little has been accomplished in the decade between book editions. A secondary lesson from this need suggests that enterprises publishing content on the Internet should take great care to provide resilience in their own websites.

3.   *Security of Data and Information.*

Security for data means that the integrity of the information cannot be readily compromised, creating a presumption of accuracy. Whether or not actual breaches in security have occurred, there is an inevitable loss of confidence in data that is at risk of security breakdowns.

Lapses in security can come from hackers, software malfunctions that inaccurately index data, human error, human misconduct, or other external forces that alter, destroy, corrupt or improperly disclose the data. The most common security focus is on hackers, spyware, and attacks on the integrity of information from the outside.

These are significant threats that must be taken seriously. Acts of extortion, in which an attacker encrypts the data of the target and requires payment to return access to the information, are now commonplace. A variation on this extortion occurs when the hacker threatens to release sensitive health, financial, or personal information publicly in an effort to destroy the reputation of the company with the public. Many companies bow to these forms of extortion.

Software, hardware, and other countermeasures should be deployed to protect the integrity of information and data from outside threats. Encryption should be used for any sensitive data. Well-designed data systems should store copies of nearly up-to-date data in a system that cannot be encrypted by the same attack that crippled the primary site. There are a multitude of resources to help a company reduce the risks of an outside attack and to respond efficiently when that breach inevitably occurs.

Security lapses, however, are just as likely to come from within an entity. Security problems may be caused by the owners of the information. This can occur when confidential and proprietary data is stolen or left on unsecured equipment. Security problems may be caused by the businesses which manage data when personnel have access to content that they are not trained to handle and have no reason to access. Security problems may be caused from insufficient attention to equipment, software, and environmental factors.

Enterprises have an obligation to diligently review and assess their procedures, personnel, and equipment to protect the integrity of their information. The failure to do so can compromise the validity of the organization's entire data pool. Since many companies no longer have independent paper records as independent sources of validity, the destruction of the data pool can mean the destruction of the business itself.

4.   *Reach and the Accessibility of Information.*

The greatest change to the information economy comes from the consumer's ability to access any information provided on the Internet. For the content provider, the reach of the enterprise's message is almost limitless. In traditional terms, reach of content was the size of the market that received the corporate message. A ten-second television spot during the Super Bowl maximized the reach by targeting one of the widest mass audiences available.

Theoretically, the Internet makes the reach of all content universal, but this ignores the problem of clutter on the Web. Reach becomes a measure of the population accessing the business's message. Most information can no longer be found unless the consumer already has very specific details about the information sought. Search engines on most corporate websites provide a narrow haystack in which to search for the needles of wisdom, but even these are sometime a struggle. Google and other search engines on the Internet perform an astounding task, returning pages of relevant content. The people searching, however, are unlikely to read past the first few pages of hits, making the vast majority of responses effectively invisible and certainly underutilized.

The portal systems, which were once the media companies' attempt to provide ownership and taxonomy to the Internet, collapsed under the weight of the effort. Creating the Internet's Dewey Decimal System is a daunting task given the amount and variety of available information. The task becomes impossible when the information changes, disappears, or becomes corrupt.

As a result, businesses struggle for reach of their content, even on the Internet. Today's strategy focuses on paid links at the top of the search results, paid advertising on television, websites, blogs, sponsored videos, mobile ads, game inserts, and other media. Companies sponsor all manner of online content in an attempt to drive traffic to the enterprise's message and information.

The need for reach has only increased the need for advertising and marketing. The information revolution has expanded the need for consumers' attention, with no signs of slowing in the near future. New technology in the form of blogs, RSS feeds, podcasts and videocasts, and listservs, expand reach and make content easier for consumers to find. These technologies have the unintended consequence of adding clutter to the Internet, further reducing the efficiency for finding new and useful content on the Web.

Internet media strategies are trying to clear through the clutter. Presently, these are focusing on social networks and affinity groups. Using these technologies, consumers identify self-identified similar individuals to see what choices those people are making. In all their many permutations, these trends allow Internet sites to harness the statistical ability to track website interactions to provide information on social relevance to others using the website.

5.   *Timeliness and Instant Convenience.*

While the use of the Internet suggests instant communication, another aspect of information's value comes from its timeliness. Traditional libraries struggle between operating a physical collection of materials that can be browsed immediately for check-out, in contrast with their vastly larger database of cataloged content which can often be requested for pick-up on a twenty-four hour hold. Ignoring the benefits of browsing the shelves, most patrons still prefer to have the book available on demand rather than after a day's wait.

Timeliness also reflects the marketing competition that once existed between Blockbuster and Netflix, the mail-based video rental store. Blockbuster touted the immediate availability of the titles in each of its physical locations. Netflix competed by emphasizing the depth of its collection and criticizing video rental stores' problems of being out-of-stock on popular titles. Then Netflix flipped the competition by offering its services as an on-demand streaming service. Suddenly the convenience of the video store became an antiquated model. And even though Netflix struggles with access to the top hit movies due to its competition with the Hollywood studios, its instant access business model quickly drove Blockbuster into bankruptcy.

Philip Evans and Thomas Wurster describe this phenomenon as "currency" and point to the high value of instantaneous market quotes for Wall Street market makers.[1] Timeliness is equally important for assembly line materials as it is for information. Just-in-time purchasing strategies emphasize the critical importance of having all materials available at the time they are needed while avoiding the costs of warehousing and managing materials. Blockbuster thought it understood the convenience model for business, but instant is far more powerful than nearby.

Just-in-time strategies are equally important for content as for product materials. Information that comes too late to be used cannot be helpful and delays in gathering information can be costly. Collecting and storing data has warehousing and managing costs just like those costs associated with physical materials. Consumers rebel at even adding the step of signing in to websites that host relevant content because it slows down the retrieval process.

Effective logic and labeling of navigation flows are another variation of the just-in-time model. Although the longstanding "rule" that public information should be found within three clicks of the home page has been dispelled through empirical studies, there is a high correlation between the willingness of a user to continue clicking and the certainty that the clicks will result in the anticipated goal. While fewer clicks are helpful, clear navigation and understandable structure is even more critical. Consumers expect a nearly instant return on their effort, so poor navigation or unneeded interference will discourage customer engagement.

6.   *Richness and Customization.*

Richness measures the amount of information made available in any communication. The more information delivered, the richer the content. In-home product demonstrations are the richest source of content because they communicate an almost unlimited amount of information to the consumer.

Truly rich communication is more than just in-depth. Richness comes from the ability to customize the information to the needs of each recipient and allow the recipient to directly participate in the information process. All education provides generally rich content, but the seminar class is much richer than the introductory psychology courses often offered to hundreds of college freshmen

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[1] PHILIP EVANS & THOMAS S. WURSTER, BLOWN TO BITS: HOW THE NEW ECONOMICS OF INFORMATION TRANSFORMS STRATEGY 25 (2000).

at a time. In the computer setting, the computer game may provide a much richer experience, because of its interactivity, than even a book.

Most computer games lack substantial informational content, but educational games and simulations still hold tremendous promise. For example, a virtual chemistry course could provide the same textual information as the student's chemistry book, while creating simulations in which the student selects the chemicals, conducts the experiments, and participates in the processes. It is likely that the student's recollection and understanding of the chemistry "game" would be more profound than the reading from the text, and it would better supplement the limited classroom lab time.

One of the best examples of integration of richness, timeliness, and reach is Khan Academy. Initially launched by Salman "Sal" Khan to tutor his extended family in math, Khan Academy transformed from online videos to a learning platform dedicated to the fundamentals of richness, timeliness, and reach. The richness in the content is provided by thousands of volunteers who help make K-12 educational content models covering most subjects taught around the globe. Over thirty different languages are supported. Targeted learning paths are provided for the ACT, SAT, GMAT, LSAT, and other standardized tests.

The site features instant access to thousands of lessons. More importantly, the lessons are not passive lectures or reading assignments. Students can take quizzes and tests, have those tests scored instantly, and receive effective feedback on the skills and knowledge that the student needs to focus on next. This engaged activity integrated with instant feedback maximizes the learning process. In addition, the reach of Khan Academy is worldwide, with many primary languages and content geared to students in North America, Europe, Asia, the Middle East, Africa, and virtually every other part of the globe. Through its integration of richness, timeliness, and reach, Khan Academy embodies the best the Internet has to offer.

## 7.	The Information Marketplace.

Without rich, reliable content, the entrepreneur of the information-based company has nothing to offer. With quality content, the next challenge is to be noticed through the myriad of traditional media, Internet, and other techniques. Many of these information techniques have remained the same, while a few are unique to the information marketplace.

- Television advertising
- Radio advertising
- Print magazine and newspaper advertising
- Print magazine and newspaper content
- E-mail newsletters and advertising
- Website advertising
- Blogs and video channels
- Postings to social media, newsgroups, Usenet sites, community boards, and similar spaces
- Social networking
- Management of multiple websites cross-linking and promoting the content at each site
- Direct mail advertising

- Billboards

- Wireless marketing, broadcasting in hotspot zones

- Sponsorships of websites, charities, and public events

- Sponsorship of mobile devices and geo-cached public locations

In *Blown to Bits*, Evans and Wurster suggest that, historically, the relationship between richness and reach has been a direct, inverse relationship.[2] They explained that published books had a richness to their content, but they did not have the circulation or reach of the television commercial, since books are typically read by thousands while television commercials are viewed by millions. University courses were even richer than the books used to teach, but reached even fewer pupils. Particularly if the cost and medium were held constant, this inverse relationship appeared consistent. The Internet and other low-cost distribution media changed this formula. The disintermediation caused by new technology unlocks the relationship between richness of content and its potential reach.

The ability to expand richness without sacrificing reach affects consumers and businesses in a number of ways. As Internet commerce transformed business, many successful companies focused on process innovation to "replace the middleman." For example, used car purchasing and consumer lending are two industries where the profit margins are rapidly dropping. Realtors have come to rely on sites like Zillow for home pricing and availability information. The number of travel agencies dropped considerably, while those that remain provide specialized customer service. Companies focusing on process innovation have largely eliminated companies that relied on market inefficiencies for their profits.

The relationship between richness and reach has been largely eliminated on the Internet and through other computer technologies. All content is distributed through the Internet at a cost limited to that of server space and bandwidth. While not zero, the cost is negligible for any particular transaction.

Richness of content is greatly enhanced by the ability of the customer to customize or interact with the content. The success of the door-to-door demonstration was the ability to answer the homeowner's questions rather than the comprehensiveness of the sales pitch. Consumers and researchers want their questions answered more than they want to know that all possible information has been made available. The car demo websites were effective because consumers could customize the cars being offered and focus on the details of interest to the purchaser. They also connected the consumer directly to the dealership and solved the problem of closing the transaction.

Early adopters of product CDs and websites focused on richness without remembering to address issues of reliability, resiliency, and security. Consumers were frustrated by the changing location of information, the changes in the content, and the concerns about security regarding the personal information requested on those websites.

While richness is no longer an obstacle to customer relations, the other aspects of successful content maintenance and customer relations have not been fully resolved. The best Internet and technology companies focus on each of these elements of data, gaining a commercial advantage in the process. Amazon, for example, has excellent data resilience for its customers, so re-orders are easy, returns are understood, and information from other customers is quickly updated. While Walmart is

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[2] *Id.* at 24.

a larger retailer and moving into the online market business, it does not have the same attention to the data ecosystem, and the customer experience suffers as a result.

Beyond these issues, perhaps the greatest challenge to information producers continues to be the cost of reach. No longer tied to richness or resilience, Internet clutter and widespread competition continues to create high costs to attract and retain customers. Content and data producers need to reach the intended audiences to be successful, so the competition focuses initially on the reach of the message, more than its content.

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Sidebar—Information Management for the Successful New Business.

The successful information-based company will pay close attention to each of the six attributes of quality information.

- The reach of the content must be sufficient so the consumer can find the information, whether through traditional advertising or social networking.

- To be rich, the content must provide a wealth of usable, customizable information that addresses the questions likely to be asked by consumers so it will be considered useful.

- To remain valuable, however, the content must be secure, so that the user has no fears that the data has been compromised or that the source of the data will compromise the user's computers.

- To be useful, the information must be timely and accessible at the time the consumer needs to find the information.

- The information must be resilient, available each time the consumer returns to the source of the content.

- The information must be reliable—vetted and accurate so that it can be cited as a source or relied upon.

Taken together, the modern enterprise must constantly struggle to expand its reach to the marketplace with increasingly rich, reliable content. The public has developed high expectations of security and reliability of content and content providers. Entrepreneurs today must enter the market meeting these expectations if they hope to succeed.

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